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Scott et al.

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(54) **CALLEE REJECTION INFORMATION FOR REJECTED VOICE CALLS**

(71) Applicant: **Telstra Corporation Limited**, Melbourne (AU)

(72) Inventors: **Andrew Ewart Scott**, Melbourne (AU); **Peter Scott Black**, Melbourne (AU); **David William Maxwell Reekie**, Enfield (GB); **Phillip John Rennie Pearl**, Enfield (GB); **James Edward Broughton**, Enfield (GB); **Douglas Gavin Currie**, Enfield (GB)

(73) Assignee: **Telstra Corporation Limited**, Melbourne, Victoria (AU)

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H04M 1/253 (2006.01)
H04M 1/64 (2006.01)

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(58) **Field of Classification Search**
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USPC 348/14.01–14.03; 379/88.13, 88.16; 370/352
See application file for complete search history.

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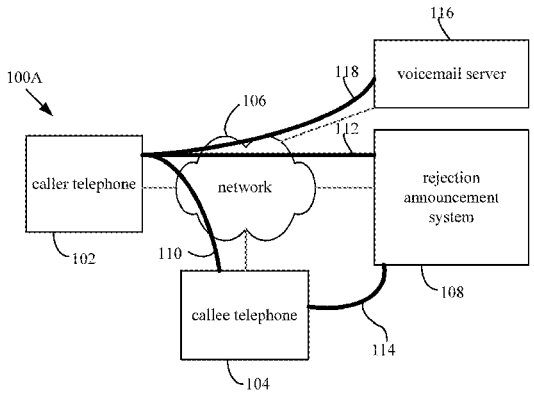
Primary Examiner — Melur Ramakrishnaiah
(74) *Attorney, Agent, or Firm* — Nixon Peabody LLP

(57) **ABSTRACT**

A system includes a rejection module in a phone configured to receive calls over a network and a remote rejection announcement server (RAS) configured to receive calls over the network. The rejection module is configured to generate at least a portion of an incoming call user interface (UI) on the phone. The UI indicates incoming call signalling, associated with an incoming call from a caller, over a call signalling path in the network. One or more rejection options is provided for selection by a caller. Rejection reason data is generated based on selecting one of the rejection options. The rejection reason data is sent using a rejection reason path separate from the call signalling path. The remote RAS is configured to receive the incoming call from the caller, receive the rejection reason data over the rejection reason path, and generate an audio/video message based on the rejection reason data.

32 Claims, 9 Drawing Sheets



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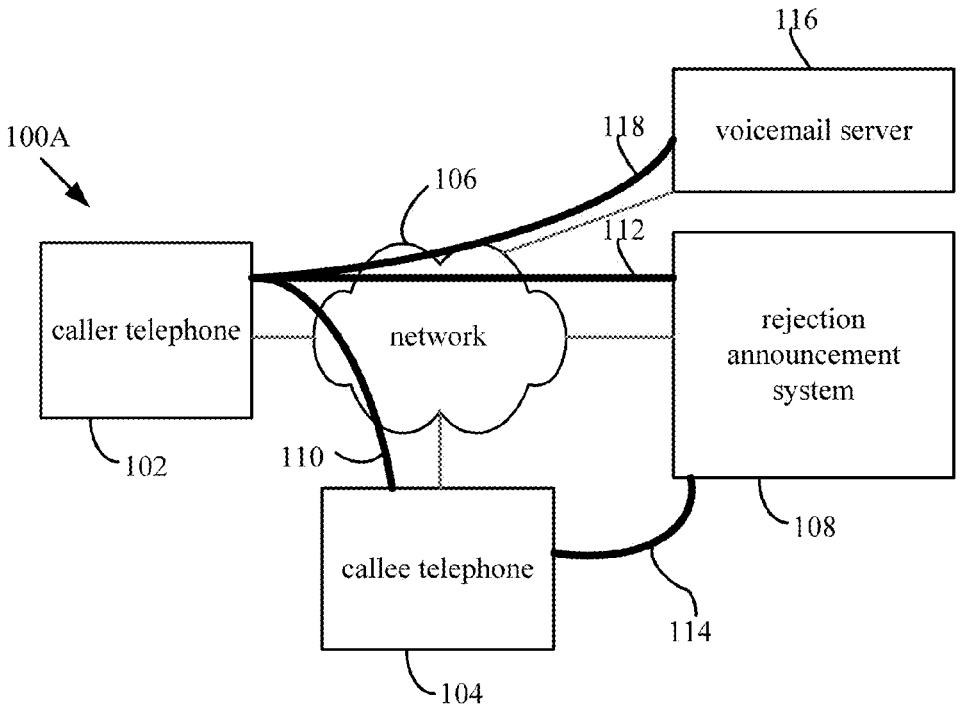

Figure 1A

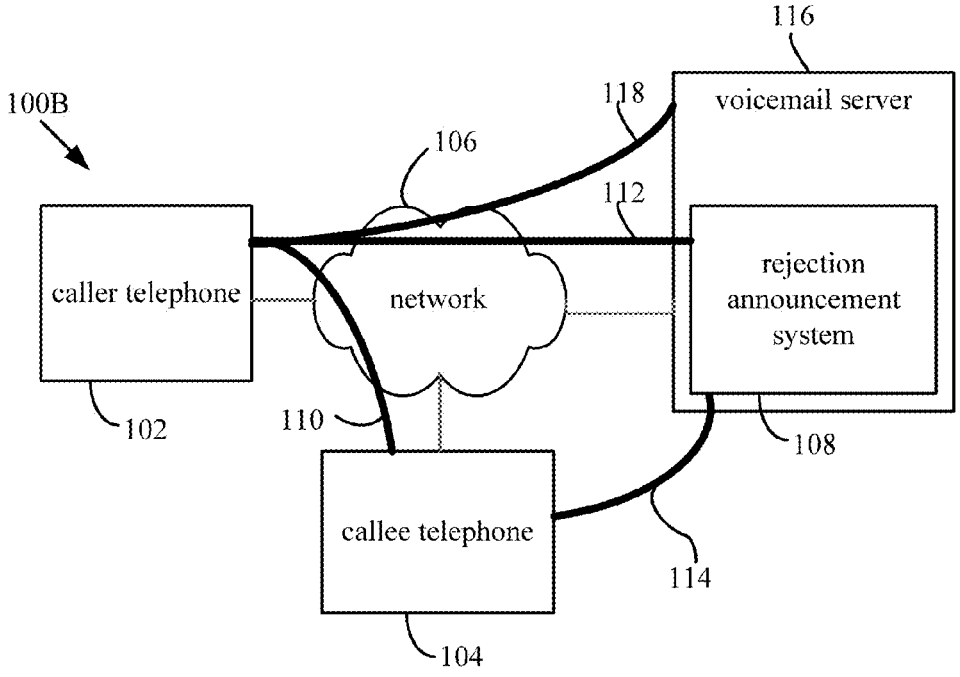

Figure 1B

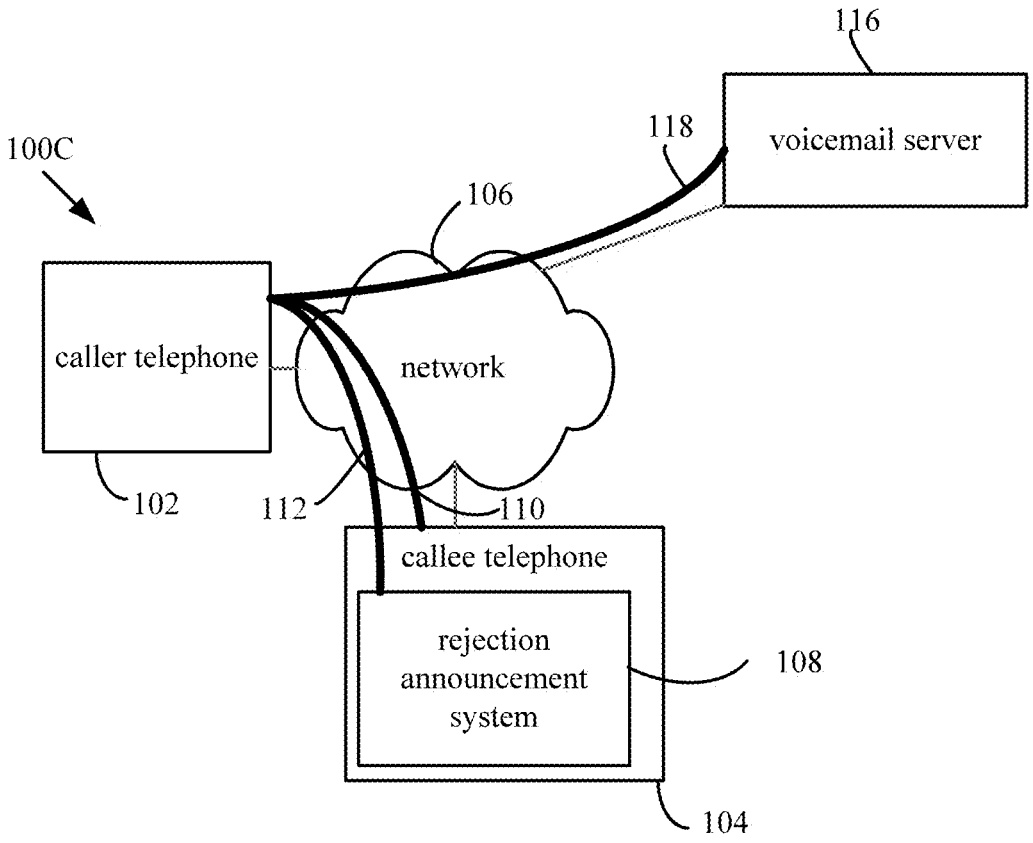
116
voicemail server
118
100C
106
caller telephone
network
102
112
110
callee telephone
rejection announcement system
108
104

Figure 1C

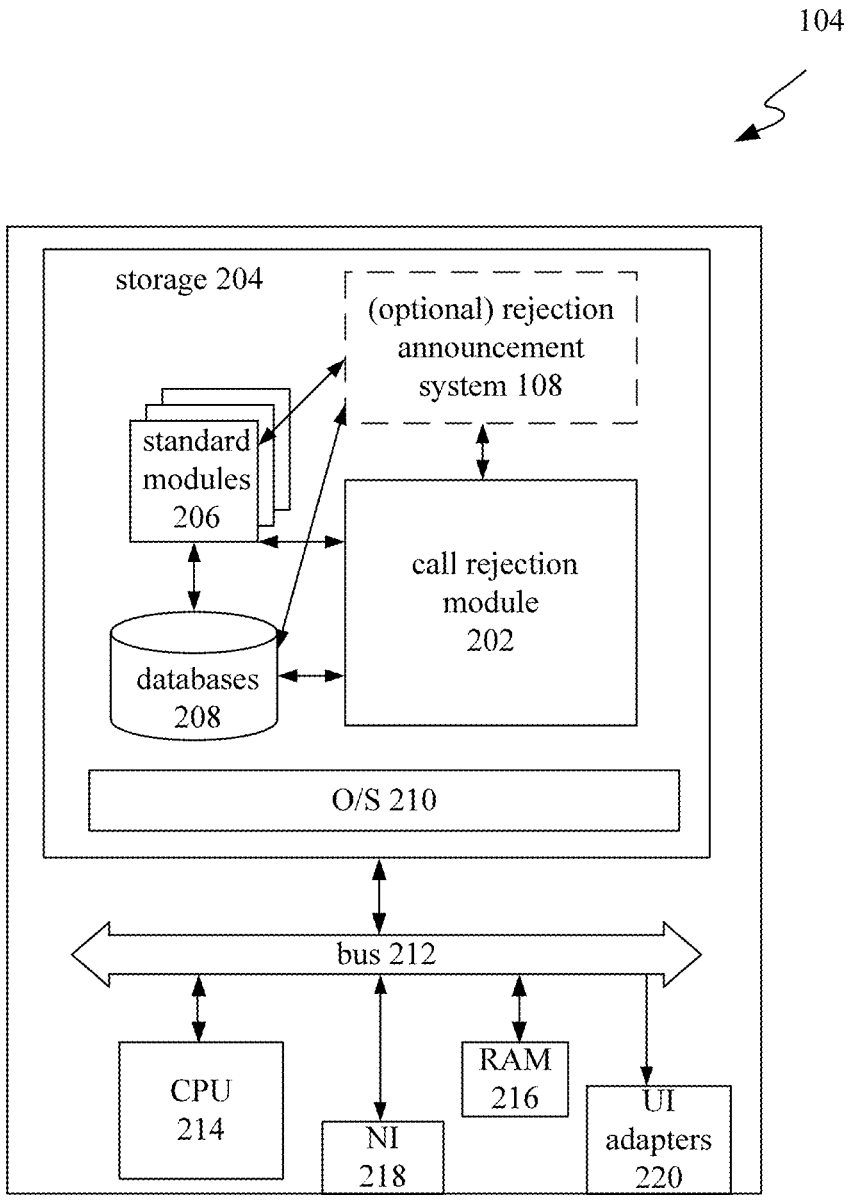
104
storage 204
(optional) rejection announcement system 108
standard modules 206
call rejection module 202
databases 208
O/S 210
bus 212
CPU 214
NI 218
RAM 216
UI adapters 220

Figure 2

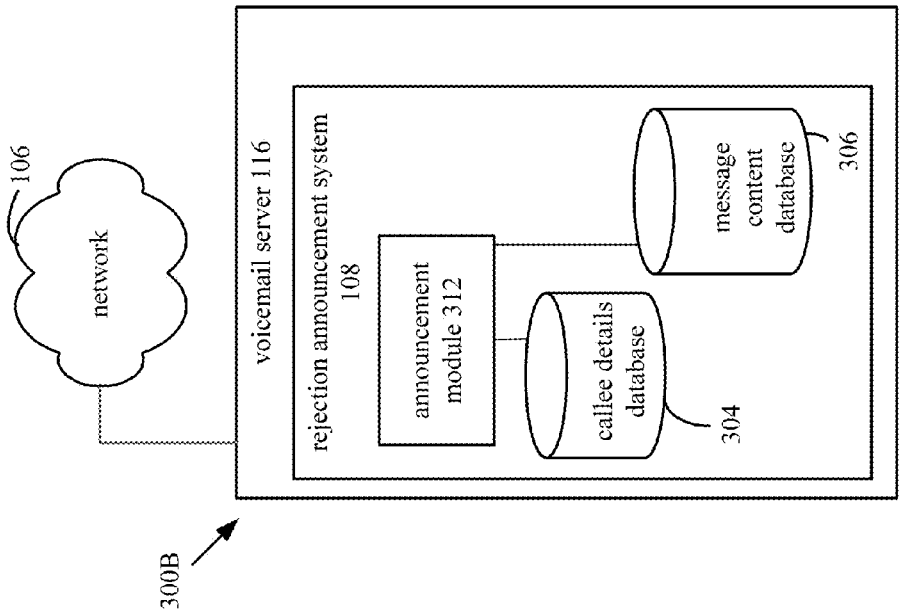

Figure 3B

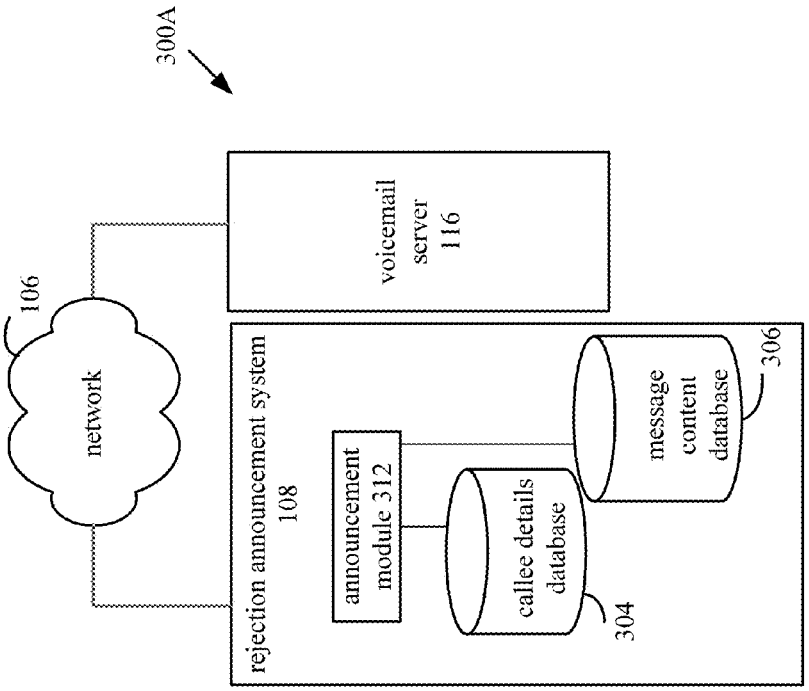

Figure 3A

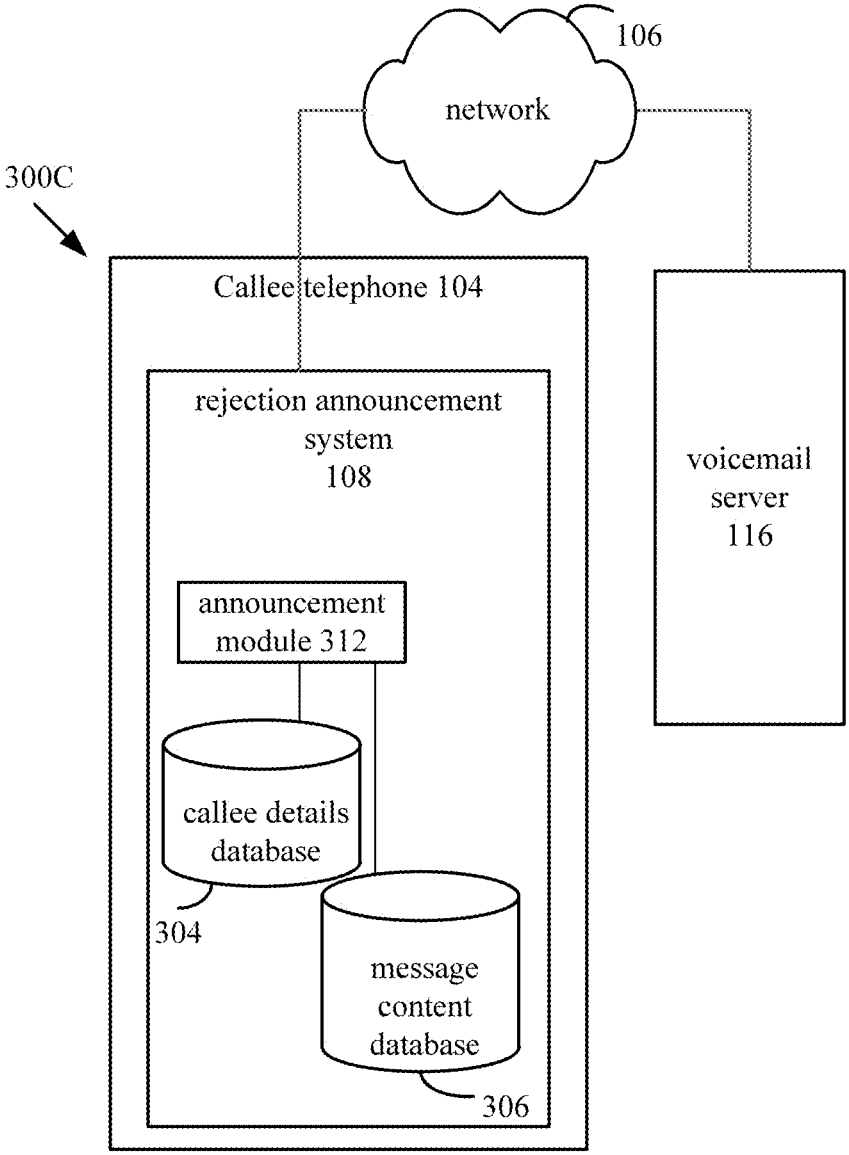
106
network
300C
Callee telephone 104
rejection announcement system 108
voicemail server 116
announcement module 312
callee details database
304
message content database
306

Figure 3C

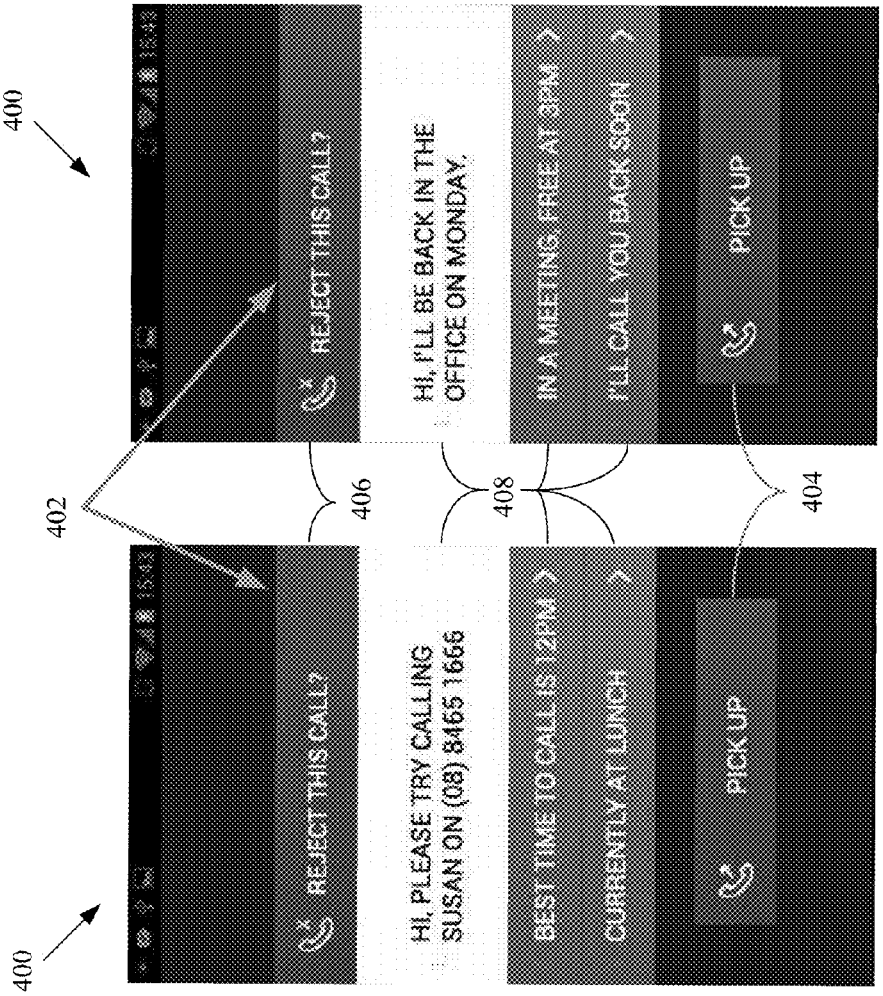

Figure 4B

Figure 4C

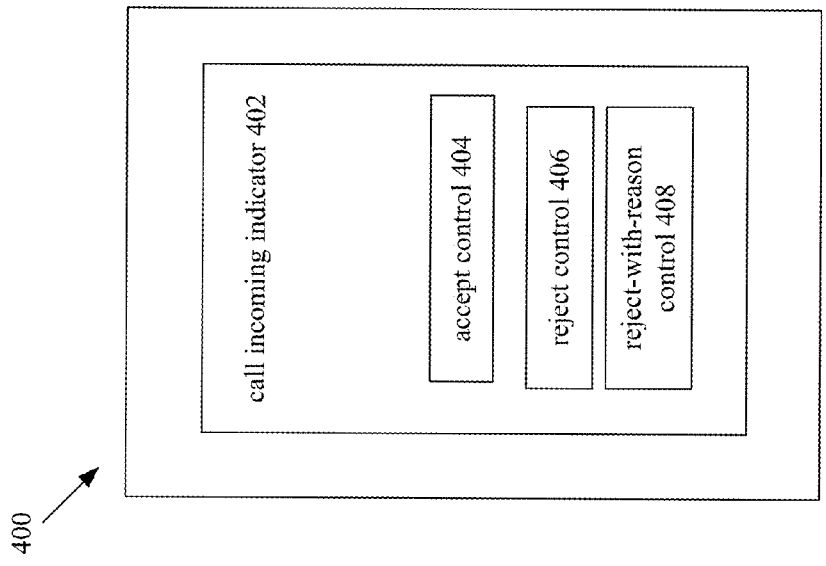

Figure 4A

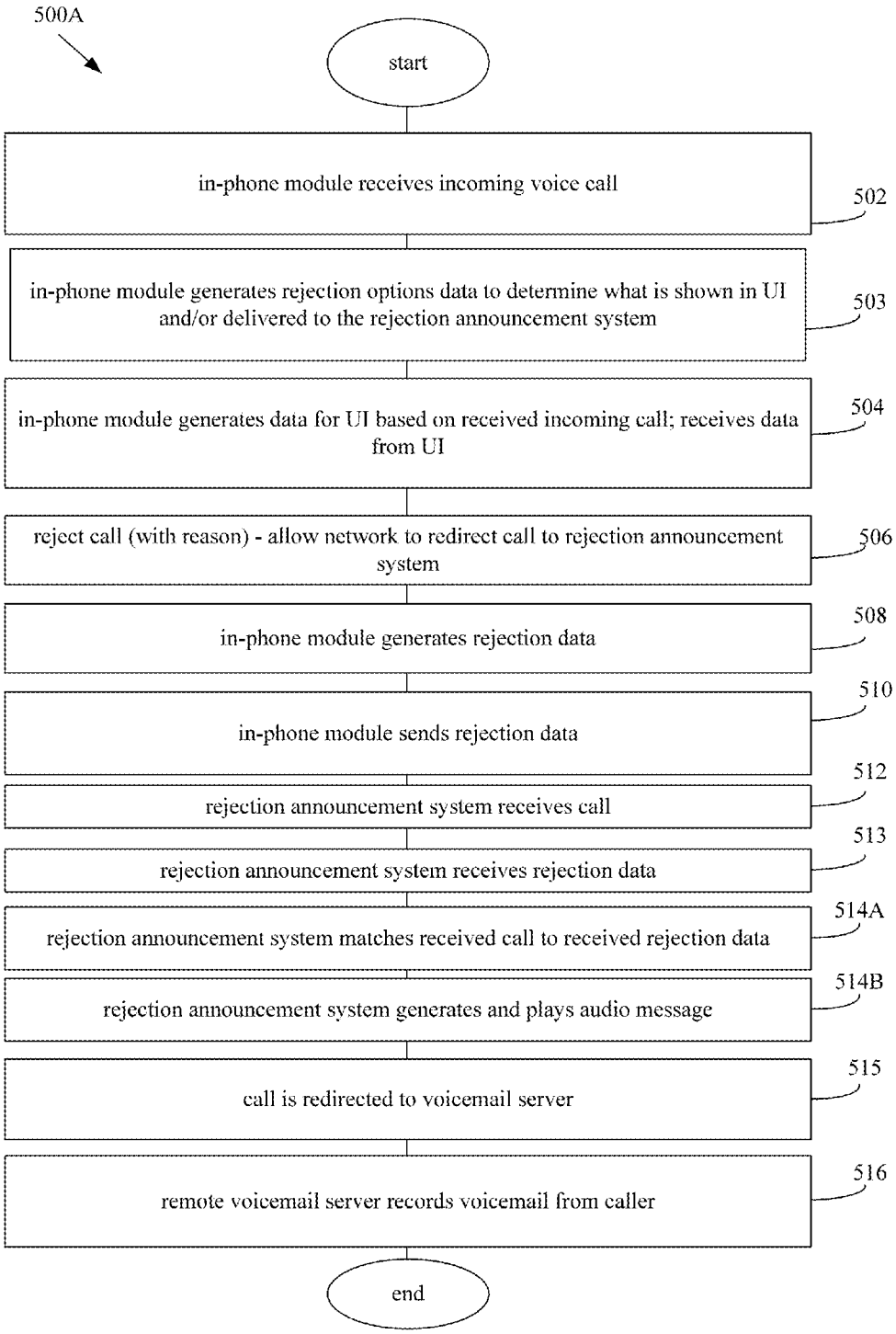
500A
start
in-phone module receives incoming voice call
502
in-phone module generates rejection options data to determine what is shown in UI and/or delivered to the rejection announcement system
503
in-phone module generates data for UI based on received incoming call; receives data from UI
504
reject call (with reason) - allow network to redirect call to rejection announcement system
506
in-phone module generates rejection data
508
in-phone module sends rejection data
510
rejection announcement system receives call
512
rejection announcement system receives rejection data
513
rejection announcement system matches received call to received rejection data
514A
rejection announcement system generates and plays audio message
514B
call is redirected to voicemail server
515
remote voicemail server records voicemail from caller
516
end

Figure 5A

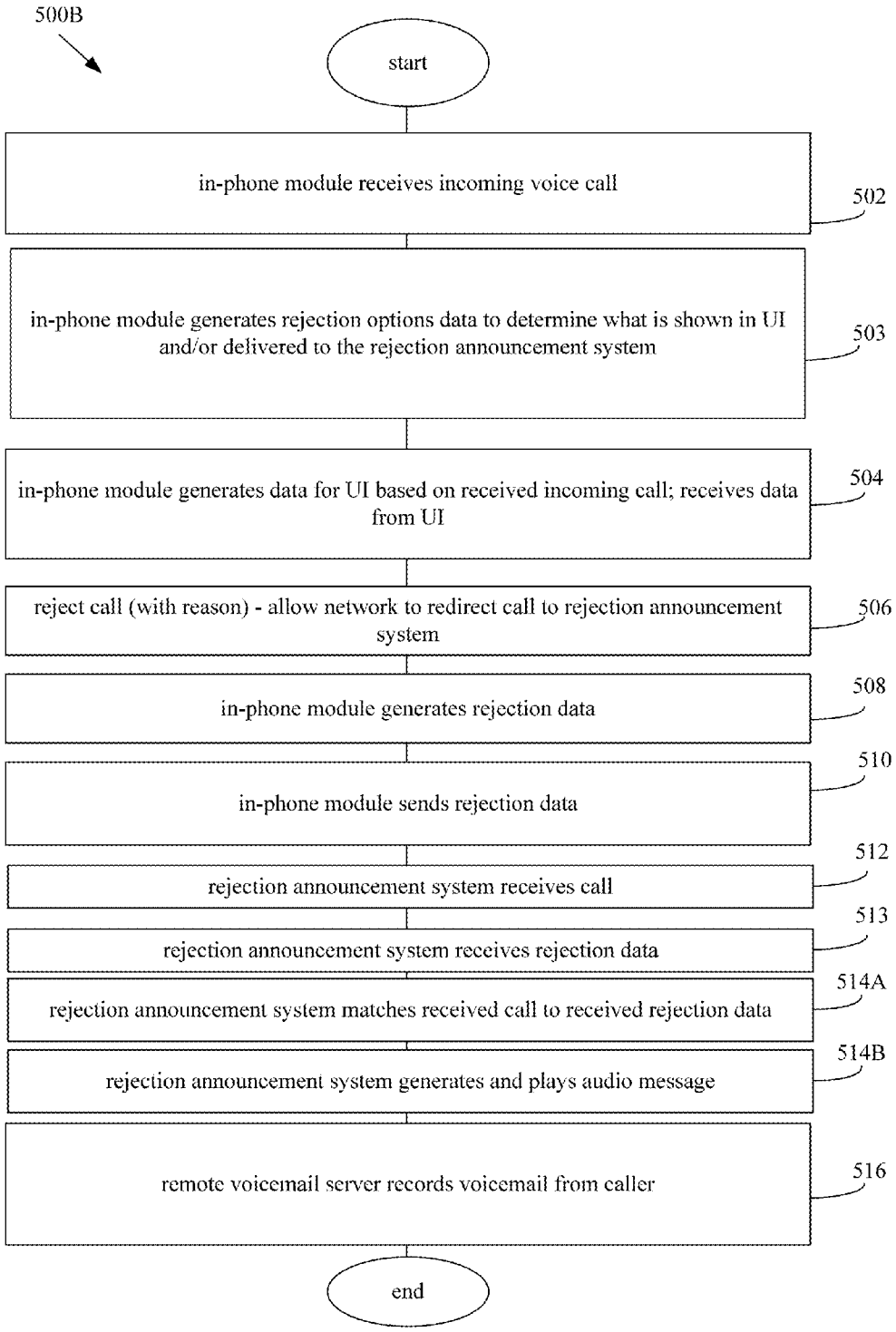
500B
start
in-phone module receives incoming voice call
502
in-phone module generates rejection options data to determine what is shown in UI and/or delivered to the rejection announcement system
503
in-phone module generates data for UI based on received incoming call; receives data from UI
504
reject call (with reason) - allow network to redirect call to rejection announcement system
506
in-phone module generates rejection data
508
in-phone module sends rejection data
510
rejection announcement system receives call
512
rejection announcement system receives rejection data
513
rejection announcement system matches received call to received rejection data
514A
rejection announcement system generates and plays audio message
514B
remote voicemail server records voicemail from caller
516
end

Figure 5B

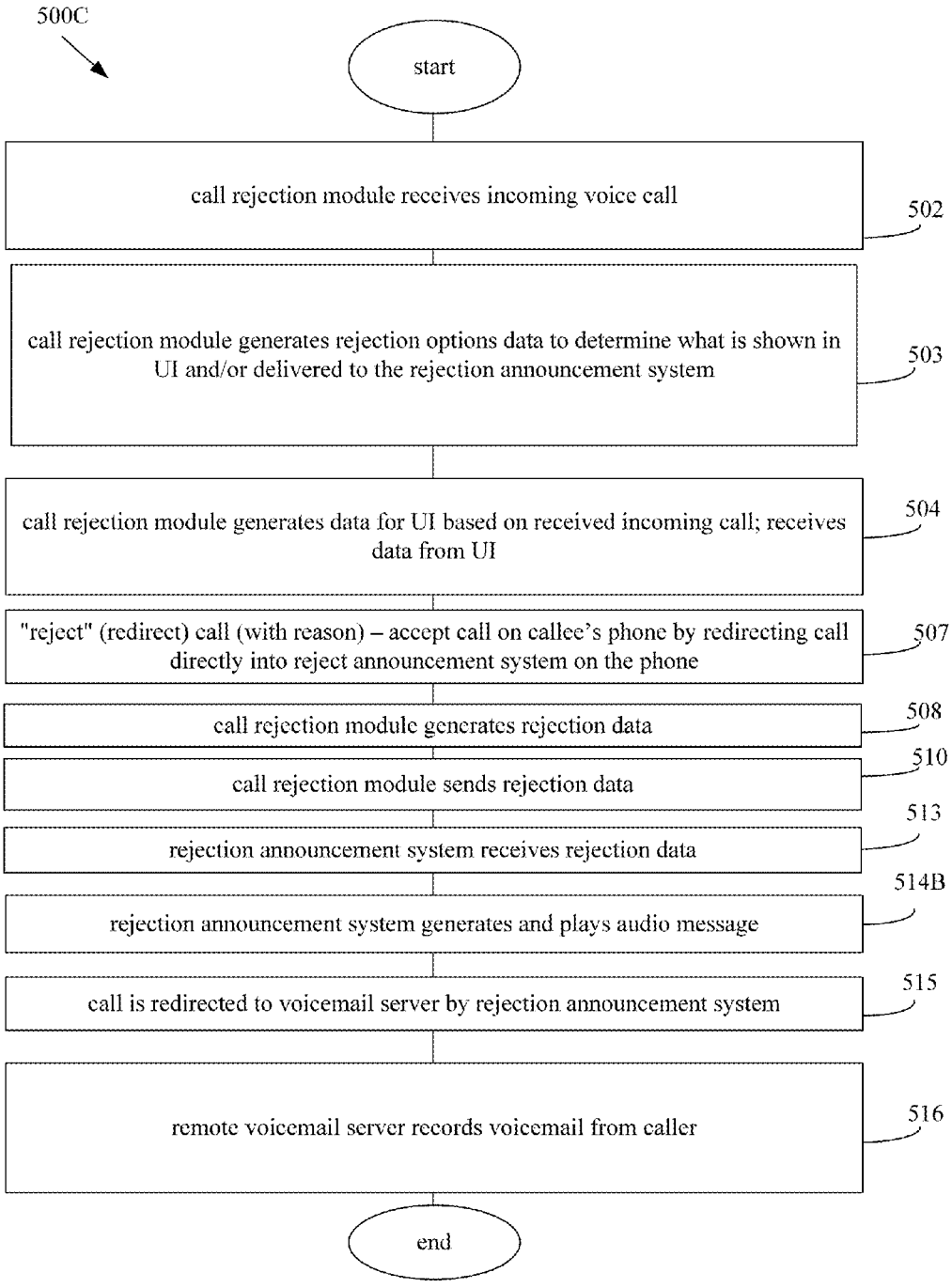
500C
start
call rejection module receives incoming voice call
502
call rejection module generates rejection options data to determine what is shown in UI and/or delivered to the rejection announcement system
503
call rejection module generates data for UI based on received incoming call; receives data from UI
504
"reject" (redirect) call (with reason) – accept call on callee's phone by redirecting call directly into reject announcement system on the phone
507
call rejection module generates rejection data
508
call rejection module sends rejection data
510
rejection announcement system receives rejection data
513
rejection announcement system generates and plays audio message
514B
call is redirected to voicemail server by rejection announcement system
515
remote voicemail server records voicemail from caller
516
end

Figure 5C

CALLEE REJECTION INFORMATION FOR REJECTED VOICE CALLS

RELATED APPLICATIONS

The disclosures of the originally filed specifications of the following related applications are incorporated by reference herein in their entireties: Australian Provisional Patent Application No. 2012904788, filed 31 Oct. 2012, entitled "Callee Rejection Information For Rejected Voice Calls;" and Australian Patent Application No. 2013204656, filed 12 Apr. 2013, entitled "Callee Rejection Information For Rejected Voice Calls."

TECHNICAL FIELD

The present invention relates to communications systems, communications methods and computer-readable media for providing rejection information to a caller when voice calls to a phone are not answered by a user of the phone.

BACKGROUND

Telecommunications systems enable two parties at a distance (a caller calling a phone, and a callee using the phone) to establish a voice call for the purposes of exchanging information, reaching agreements and taking direction, etc., through an audio-based session or a video-based session. For such sessions or calls to be established, both the caller and the callee need to be in an appropriate state of readiness to conduct the call, with the caller proposing the call through dialing the callee, and the callee accepting the call, e.g., by lifting the receiver of a fixed phone (e.g., a phone on the public switched telephone network) or pressing the answer button on a mobile phone.

However, although a mobile phone network allows a person to receive a call almost anywhere, it also means that the phone can ring when the callee is not in a position to answer the call, such as when they are in a meeting, travelling, or otherwise indisposed, leaving the caller to, at best, record a voicemail message (which is also referred to as a voicemail) on the callee's voicemail system with the hope that at some point in the future the callee will listen to it.

If an incoming call is rejected by a callee, e.g., by pressing a hang-up button or by not answering the call in time, there is generally no context given to the caller on the callee's availability or when the voicemail might be listened to. The callee may be busy for hours in meetings, but the caller doesn't know. Consequently, there can be uncertainty for the caller about when the callee will be in a position to return the call. For an urgent matter, a caller may then attempt to contact the callee using additional methods, e.g., using text messages (also referred to Short Message Service—or SMS—messages), emails, instant messaging programs or further voice calls, and these can place additional burdens on the caller and/or the callee. For example, the callee might compose and send a text message back to the caller after rejecting their incoming call; however, this requires the callee to be able to compose the text message, which may be difficult in an active meeting or while travelling. Even if the callee automatically generates a text message reply (e.g., based on a pre-prepared message text), the caller will need to have a phone capable of receiving the text message, and the text message is likely to be read by the caller only after the call is finished, in which case the caller would fail to take the information in the text message into account immediately, e.g., when recording a voicemail message, or sending their own text message.

Existing applications (e.g., Office Communicator) can provide presence information to users, to help users understand whether a person is busy before making a call. However, these systems may be limited to seeing presence information only of people within the organisation, and require both users (caller and intended callee) to use the presence system. Furthermore, such systems fail to provide callee call-by-call control over how the presence information is shared with callers.

It is desired to address or ameliorate one or more disadvantages or limitations associated with the prior art, or to at least provide a useful alternative.

SUMMARY

In accordance with the present invention there is provided a system including a rejection module in a phone configured to receive calls over a network and a remote rejection announcement server (RAS) configured to receive calls over the network. The rejection module is configured to generate at least a portion of an incoming call user interface (UI) on the phone. The UI indicates incoming call signalling, associated with an incoming call from a caller, over a call signalling path in the network. One or more rejection options is provided for selection by a user of the phone. The rejection module generates rejection reason data based on selection of one of the rejection options. The rejection reason data is sent using a rejection reason path that is separate from the call signalling path. The remote RAS is configured to receive the incoming call from the caller, receive the rejection reason data over the rejection reason path, and generate, based on the rejection reason data, an audio/video message for the caller.

The present invention also provides a communications method that includes indicating incoming call signalling, associated with an incoming call from a caller, over a call signalling path in a network by generating at least a portion of an incoming call user interface (UI) on a phone. One or more rejection options is provided for selection by a user of the phone. Rejection reason data is generated based on selection of one of the rejection options. The rejection reason data is sent using a rejection reason path that is separate from the call signalling path. The incoming call from the caller is received at a remote rejection announcement system (RAS). The rejection reason data is received at the remote RAS over the rejection reason path. Based on the rejection reason data, an audio/video message is generated for the caller.

The present invention also provides computer-executable instructions stored in computer-readable storage for controlling one or more computer processors to execute the steps of the communications methods provided by the present invention.

Examples may provide a system including a rejection module in a phone configured to generate at least a portion of an incoming call user interface (UI) on the phone, the UI indicates an incoming call from a caller. The rejection module provides one or more rejection options for selection by a user of the phone, generates rejection reason data based on selection of one of the rejection options, and sends the rejection reason data. The system includes a rejection announcement system (RAS) configured to receive the rejected call, receive the rejection reason data, and generate, based on the rejection reason data, an audio/video message for the caller. The rejection module is configured to generate the rejection options and/or the rejection reason data based on callee availability data, representing when the callee is available, which is generated using calendar data from the phone.

Examples may also provide a system including a rejection module in a phone and a rejection announcement system (RAS) in the phone. The rejection module is configured to generate at least a portion of an incoming call user interface (UI) on the phone. The UI indicates an incoming call from a caller. The rejection module is further configured to provide one or more rejection options for selection by a user of the phone, redirect the incoming call to the RAS in response to selection of one of the rejection options, and generate rejection reason data based on the selected rejection option. The RAS is configured to receive the redirected call, receive the rejection reason data, and generate, based on the rejection reason data, an audio/video message for the caller.

Examples may also provide a communications method including generating at least a portion of an incoming call user interface (UI) on a phone, said UI indicating an incoming call from a caller. One or more rejection options is provided for selection by a user of the phone. Rejection reason data is generated based on selection of one of the rejection options. The rejection reason data is sent to a rejection announcement system (RAS). The rejected call and the rejection reason data is received by the RAS. Based on the rejection reason data, an audio/video message is generated for the caller. The rejection options and/or the rejection reason data are generated based on callee availability data, representing when the callee is available, which is generated using calendar data from the phone.

Other examples may provide a communications method including generating at least a portion of an incoming call user interface (UI) on a phone. The UI indicates an incoming call from a caller. One or more rejection options is provided for selection by a user of the phone. The incoming call is redirected in response to selection of one of the rejection options. Rejection reason data is generated based on the selected rejection option. The rejection reason data is sent to a rejection announcement system (RAS) in the phone. The redirected call and the rejection reason data is received by the RAS. Based on the rejection reason data, an audio/video message is generated for the caller.

BRIEF DESCRIPTION OF THE DRAWINGS

Preferred embodiments of the present invention are hereinafter further described, by way of example only, with reference to the accompanying drawings, in which:

FIG. **1**A is a block diagram of a communications system with a rejection announcement system (RAS) separate from a voicemail server and a callee telephone;

FIG. **1**B is a block diagram of a communications system with the RAS in the voicemail server;

FIG. **1**C is a block diagram of a communications system with the RAS in the callee telephone;

FIG. **2** is a block diagram of the callee telephone in the communications system;

FIG. **3**A is a block diagram of a separate-RAS configuration in the communications system of FIG. **1**A;

FIG. **3**B is a block diagram of a RAS-in-voicemail configuration in the communications system of FIG. **1**B;

FIG. **3**C is a block diagram of a RAS-in-phone configuration in the communications system of FIG. **1**C;

FIG. **4**A is a diagram of a user interface of the callee telephone;

FIGS. **4**B and **4**C are screen shots of example user interfaces of the callee telephone; and

FIGS. **5**A, **5**B and **5**C are flow charts of communications methods provided by the communications systems in FIGS. **1**A, **1**B and **1**C respectively.

DETAILED DESCRIPTION

Overview

Described herein is a system including a call rejection module and a rejection announcement system (RAS). The call rejection module is in a user's phone. The RAS may be in the phone or remote from the phone. The call rejection module is configured to: generate at least a portion of an incoming call user interface (UI) on the phone, said UI indicating an incoming call from a caller (by indicating receipt of incoming call signalling, associated with the incoming call from the caller, from a network over a call signalling path), and providing one or more rejection options for selection by a callee (i.e., the user of the phone), reject the incoming call (or cause the incoming call to be redirected), in response to selection of one of the rejection reason options, and generate rejection reason data based on the selected rejection option and available data from the phone. Rejecting the incoming call can be referred to as "redirecting" the call or "diverting" the call, and this can be either active (the phone sends a voice rejection signal to the network, over a voice-rejection path that may be the same as the call signalling path, to redirect the call to the remote RAS; or the rejection module sends a signal to the in-phone RAS to accept the call on the phone), or passive (the network redirects the call if it not answered within a preselected answer time). The RAS is configured to: receive and accept the rejected or redirected call, receive the rejection reason data over the rejection reason path in the network, generate an audio/video message based on the rejection reason data, and play the audio/video message for the caller of the call.

The selection of one of the rejection options can include receiving a user input from the UI corresponding to a rejection control (e.g., a button or a list item, or an available option in a grammar of a speech recognition module or service) of the UI. The rejection control can be generated based on rejection options data representing a label for the rejection control. The rejection reason data can be generated based on the rejection options data representing a corresponding rejection message for the audio/video message. The rejection options data can be generated by the rejection module in the phone in preparation for providing the rejection control, whereas the rejection reason data can be generated after selection of one of the rejection options.

The available data used to generate the rejection reason data and/or the rejection option data can include any one or more of:

callee availability data representing when the callee is available, e.g., in diary data or calendar data stored or provided by the phone (e.g., calendar entries);

predefined message data representing predefined rejection messages preselected by the user (e.g., "I will call back tomorrow", or "please call my office number");

personal contact data available on the phone;

location data available on the phone representing a current location of the phone (e.g., from a global positioning system);

status data available on the phone representing a current status of the callee (e.g., from a social networking system, or an out-of-office service, e.g., provided by Microsoft's "Outlook"); and

presence data available on, in or from the phone (e.g., accessed from a presence server) representing a presence of the callee.

The RAS can be configured to generate the audio/video message based on logical selection rules that associate a received rejection message (e.g., representing a current meeting in the calendar) with audio/video message content (e.g., a message saying "the callee is currently in a meeting").

The generated portion of the UI can be an entire UI or a UI enhancement (e.g., an additional button or rejection option) for an existing UI (e.g., a native call-receiving UI of the phone).

The UI can be generated using a display of the phone (for visual aspects), or using a speaker (for audible aspect) or a vibrator (for tactile aspects). The UI can receive input from the callee to select one of the rejection options manually (e.g., using buttons on the phone, such as soft buttons or hard buttons, or moving the phone by shaking or turning it) and/or verbally (e.g., using a speech recognition service, such as Apple's "Siri").

The available data from the phone may be stored in the callee phone, and/or may be available to the phone from a remote server, e.g., via a cloud service, based on authentication data in the phone. For the remote data on a remote server, the phone accesses the remote data to at least temporarily store the available data, and the call rejection module accesses the available data from the phone. The available data may be synchronised with the remote data by a synchronisation module or service in the phone. An example may be remote availability data in a cloud calendar (e.g., Google's "Calendar") that is made available from the phone.

The call rejection module is configured to detect the incoming call over a network that is configured to carry audio and/or video connections and associated signalling to establish these connections. The network supports: audio-specific channels using protocols and network infrastructure configured specifically for audio-only voice communications; and/or video-specific channels using protocols and network infrastructure configured specifically for combined audio-video communications. The incoming call signalling can thus represent a request for an audio call (also referred to as a "voice call") or a video call (which includes audio and video). The network can include:

(a) a packet-switched network, e.g., based on: the Internet Protocol (IP); Voice over Internet Protocols (VoIP) including the Session Initiation Protocol (SIP), the Real-time Transport Protocol (RTP), the Gateway Control Protocol ("H.248" from the International Telecommunication Union's Telecommunication Standardization Sector), the Skype Protocol; or a fourth generation (4G) mobile phone standard; and/or

(b) a circuit-switched network supporting circuit connections according to International Telecommunication Union (ITU) protocols, e.g., based on second generation (2G) or third generation (3G) mobile phone standards, or a Public Switched Telephone Network (PSTN).

The signalling is carried over paths in the network. For a remote RAS, the rejection reason data may be sent by the call rejection module to the remote RAS using either: (1) a rejection reason path that is the same as the call signalling path; or (2) a rejection reason path that is separate from the call signalling path. The rejection reason path can be the same as the call signalling path by reconfiguration of the network communications protocols, e.g., by adding additional data to the signalling message (e.g., by extending the SIP protocol in a packet-switched network, or by extending the protocols in a circuit-switched network). In a circuit-switched network, the call signalling path is the network path used for the incoming call signalling, and for the voice rejection signal if the call is rejected. In a packet-switched network, the call signalling path is defined by the VoIP session. Using the same path for the rejection reason data and the call signalling may be referred to as "in-band signalling". The separate rejection reason path may be implemented using a web-services interface, as described hereinafter. The separate rejection reason path may use the existing network protocols to communicate directly with the remote RAS, e.g., by attempting to establish a separate voice call with the RAS, e.g., using the PSTN, in which case the remote RAS is configured to detect the signalling in the call from the callee phone and receive the rejection reason data in the call signalling associated with the call from the callee phone. Having a rejection reason path that is separate from the call signalling path (i.e., using a separate network path for communication between rejection module and the RAS) can allow for easier implementation because no reconfiguration or adaption of the standard network communications protocols is required. Using the different path for the rejection reason data and the call signalling may be referred to as "out-of-band signalling".

The communications system may be configured to have the RAS implemented: (i) in the phone (the callee's phone); (ii) in a voicemail system that is remote from the phone and configured to receive voicemail from the caller; or (iii) in a separate and remote rejection announcement platform. In the configuration with the RAS in the phone, the call is accepted on the callee's phone for the purpose of playing the rejection announcement prior to the call being redirected to a voicemail server in the voicemail system. In the configuration with the remote RAS, a rejected call can be redirected by the voice network to the remote RAS using standard protocols and networking equipment. The rejected call may be actively rejected by the phone sending a rejection signal (also known as a call diversion signal) to the network over the voice-rejection path. The rejected call may be passively rejected by the phone failing to answer the call within a preselected pick-up time (e.g., a ring time defined for the callee phone number in the network), and the network itself then redirecting (or "diverting") the passively "rejected" call to the remote RAS. The rejected call may be redirected to the remote RAS by the voice network using standard network protocols.

Systems

Communications systems **100**A, **100**B, **100**C for providing rejection information, for a caller when an incoming call is rejected, can be deployed in different arrangements or configurations, as shown in FIGS. **1**A to **1**C. The communications systems **100**A, **100**B, **100**C include a caller phone **102** operated by a person (referred to as a "caller") making a telephone call. The caller phone **102** is connected (by communication means) to a network **106**, which in turn connects to a callee telephone **104**. The callee telephone **104** is connected to the caller telephone **102** by the network **106** after the caller initiates the call. The network **106** can include a voice network (providing voice-specific channels) and a video network (providing video-specific channels).

The communications systems **100**A, **100**B, **100**C each include a rejection announcement system (RAS) **108** which can connect to the caller phone **102** using the network **106** after the call has been responded to by the callee phone **104**. The communication systems **100**A, **100**B, **100**C, may include a voicemail server **116** which can connect to the caller phone **102** using the network **106** after the call has been treated by the RAS **108**.

In general, during operation of the communications systems **100**A, **100**B, **100**C, the network **106** attempts to estab-

lish a voice connection **110** (audio and/or video) between the caller phone **102** and the callee phone **104**. If the call is rejected with a reason as described hereinafter, the communications systems **100**A, **100**B, **100**C redirect the call to establish a voice connection **112** between the caller phone **102** and the RAS **108**. A data connection **114** is provided between the callee phone **104** and the RAS **108** (for systems **100**A and **100**B), or between components or modules in the callee phone **104** and the RAS **108** implemented as another component or module in the callee phone **104** (for system **100**C). The nature of the data connection **114** differs based on the location of the RAS **108** which can be in the phone in the system **100**C, or remote from the phone in systems **100**A and **100**B. For the remote RAS **108** (in systems **100**A and **100**B), the data connection **114** is formed as a path in the network **106** (this path is referred to as the "rejection reason path"). The nature of the rejection reason path differs based on the configuration of the network. For a circuit switched portion of the network **106** (which may comprise the entire network **106** in some embodiments), the data connection **114** and the rejection reason path are formed by forming circuit connections through the network **106**. For packet-switched portions of the network **106** (which may comprise the entire network **106**), the data connection **114** and the rejection reason path can be routed through the network **106**, e.g., using a network address for the remote RAS **108**. For the remote RAS **108** systems **100**A and **100**B, the callee telephone **104** can send the voice rejection signal into the network **106** based on circuit-switched protocols (e.g., PSTN, mobile 2G or mobile 3G) or using packet-switched protocols (e.g., VoIP protocols, such as SIP) over a voice-rejection path defined by the network protocols. In the remote-RAS systems **100**A and **100**B, the network **106** establishes a call signalling path to the callee phone **104** to transmit the incoming call signalling, based on the circuit-switched protocols or the packet-switched protocols of the network **106** (depending which protocols connect the callee phone **104** to the network **106**). The rejection reason path, and the data connection **114**, used by the call rejection module **202** can be separate from and independent from the call signalling path and the voice-rejection path, thus allowing sending of the rejection reason data from the callee phone **104** to the remote RAS **108** without requiring adjustments of or additions to the circuit-switching protocols or the packet-switching protocols that are pre-existing in the network **106**, and specifically the portions of the network **106** that connect to the callee phone **104** and to the remote RAS **108**. In the systems **100**A and **100**B, the independent and separate rejection reason path can be formed and accessed using non-VoIP protocols, e.g., IP addressing and data formatted according to a schema, such as XML schema formatted for interpretation by the remote RAS **108**, or Web-services etc, as described hereinafter. As mentioned hereinbefore, using the separate rejection reason path can be referred to as "out-of-band signalling", and using a rejection reason path that is coincident with the call signalling path (in particular the voice-rejection path), can be referred to as "in-band signalling". The out-of-band signalling can use standard network protocols to carry the rejection reason data over the data connection **114**, e.g., IP addressing, the Extensible Messaging and Presence Protocol (XMPP), the Simple Mail Transfer Protocol (SMTP), the SIP, a Web-services Application Programming Interface (API)—based on the Voice eXtensible Markup Language (VXML) or the Call Control eXtensible Markup Language (CCXML)—for the interface to the RAS **108**, and the Parlay X APIs for the interface to the call rejection module **202**.

System **100**A is a separate-RAS system that includes the rejection announcement system (RAS) **108** connected to the voice network **106** and implemented separately from the callee phone **104** and from the voicemail server **116**, as shown in FIG. **1**A. The separate RAS **108** can be provided in a dedicated computing platform or in processors of a cloud system. The caller phone **102** can be connected to the RAS **108** through the network **106** if the callee phone **104** rejects the call. The network **106** redirects rejected calls to the RAS **108**. The RAS **108** can be remote from the caller phone **102** and the callee phone **104**, e.g., located in a central network location, and in this case the RAS **108** is referred to as a remote RAS.

System **100**B is a RAS-in-voicemail system that includes the RAS **108** implemented on or in the voicemail server **116** and connected to the network **106** using the voicemail server **116**. The caller phone **102** can be connected to the RAS **108** through the network **106** and through the voicemail server **116** if the callee phone **104** rejects the call and the network **106** redirects the rejected call to the voicemail server **116**. The RAS **108** and voicemail server **116** may be referred to as being remote from the callee phone **104**.

System **100**C is a RAS-in-phone system that includes the RAS **108** implemented on or in the callee phone **104**. The RAS **108** is thus connected to the network **106** using the callee phone **104**. The caller phone **102** can connect to the RAS **108** through the network **106** and the callee phone **104**. If call-receiving modules in the callee phone **104** reject the call, these modules redirect the rejected call to the RAS **108** internal to the callee phone **104**.

The network **106** can include:

(a) a packet-switched IP network, operating on a VoIP protocol (e.g., SIP/RTP, H248 or Skype) and the callee phone **104** can include a VoIP client configured to receive the call (the caller phone **102** can be a standard phone, e.g., a mobile/cellular telephone, or another VoIP client);

(b) a circuit-switched telephony network including other network standards, (e.g., ITU protocols) e.g., a Public Switched Telephone Network (PSTN), a Integrated Services Digital Network (ISDN), a video calling network, etc, that provide one or more of the connections **110**, **112**, **118**;

(c) mobile circuits of a telephony network connecting the caller phone **102** and the callee phone **104**; and

(d) a packet-switched data connection between the callee phone **104** and the announcement system **108**.

The callee phone **104** can be a smart phone from a commercial manufacturer, e.g., one of Apple's "iPhone" phones, Samsung's "Galaxy" phones, Google's "Nexus" phones, etc. The callee phone **104** can be a cellular or mobile handset. The callee phone **104** may be a portable computing device: e.g., a tablet computer (e.g., Apple's "iPad", or Samsung's "Galaxy Tab"), a notebook computer, a laptop computer, etc. The callee phone **104** may be a desktop computing apparatus, e.g., a commercially available personal computer, Apple's "Mac", Lenovo's "THINKPAD", etc. The callee phone **104** can be a combined voice-and-data apparatus, e.g., Telstra's "T-Hub", which includes a PSTN connection and a data connection. The callee phone **104** can be a single device, or a plurality of connected devices, e.g., a mobile handset with a Bluetooth controller.

The voicemail server **116** can be implemented in a standalone voicemail platform or in servers provided by a cloud system.

The callee phone **104** includes a call rejection module **202** stored in storage **204** of the callee phone **104**, as shown in FIG. **2**. The storage **204** can be a non-volatile memory, such as a hard disk and/or a flash memory chip(s).

The storage **204** stores commercially available modules **206**, which are standard modules (also referred to as "services") installed in the callee phone **104**, e.g., mobile phone apps from Apple's "App Store", or Google's "Play" service. The standard modules **206** on the callee phone **104** can generate the available data for the call rejection module **202** and can include any one or more of the following:

a native call-receiving module (e.g., for providing data representing an identifier of the caller, such as a telephone number of the caller phone **102**);

diary or calendar modules for providing availability data (e.g., Android Calendar);

email modules (e.g., Microsoft's "Outlook"), for providing data representing out-of-office messages;

social networking modules (e.g., from Facebook or Twitter), for providing data representing a social network status or location;

personal contact modules (e.g., an address book module), for providing data representing contact names or numbers;

location modules (e.g., in communication with Global Positioning Systems or other location services), for providing geo-location data; and

presence modules (e.g., from IPFX Limited), for providing data representing presence.

The standard modules **206** can include, or can at least access, one or more databases **208** (which represent any data stored by the standard modules **206**) in the storage **204**, e.g., containing data associated with the standard modules **206**, e.g., representing calendar entries, personal contacts, current location, a current status (e.g., in a social networking system), a presence indicator, etc. The databases **208** are accessed by the standard modules **206** during operation of the callee phone **104**.

In the RAS-in-phone system **100**C, the storage **204** also includes the RAS **108**, and data connections between the RAS **108** and each of the standard modules **206**, the databases **208** and the call rejection module **202**.

In operation, the call rejection module **202** accesses one or more of the databases **208** to access the data stored by the standard modules **206**, or accesses the standard modules **206** via their respective interfaces (e.g., Application Programming Interfaces, or APIs) to access the data of the standard modules **206**.

The call rejection module **202** also accesses the databases **208** to record and store preferences data (also referred to as configuration data) associated with the call rejection module **202** itself. The preferences data can include user preferences based on user input data from the callee e.g., to configure or personalise the call rejection module **202**. The preferences data can include rejection options data representing name (also referred to as an identifier), a display or play label (e.g., a visual label for one of the rejection controls described hereinafter with reference to FIGS. **4**A to **4**C, or an audible label for an audio UI), and the corresponding rejection message for the announcement system **108**. The preferences data may control whether the RAS **108** is configured, e.g., using internal settings, to not use voicemail, and thus terminate a call rather than redirecting it to the voicemail server **116** after the audio/video message playout.

In the RAS-in-phone system **100**C, the RAS **108** may be combined in a single application (app) in the callee phone **104**. The app may allow the callee to view and amend the preferences data, and the RAS **108** may also access the preferences data to control its operation (e.g., whether to terminate calls rather than redirecting them to the voicemail server **116**).

The call rejection module **202** is configured to accept or reject incoming voice calls based on input from the callee (i.e. the user of the callee phone **104**). If the call rejection module **202** accepts a call, the call is connected to the callee phone **104** using standard signalling and telephony modules, and the callee and caller can talk to each other using the speakers and microphones of their respective phones (the callee phone **104** and the caller phone **102** respectively).

The call rejection module **202** is configured to generate and send call rejection reason data representing information about the reasons for rejection. The RAS **108** is configured to receive and accept the rejected calls, and receive the rejection reason data from the call rejection module **202**.

As shown in FIG. **2**, the callee phone **104** includes the following computing modules and components: a commercially available operating system **210** in the storage **208**, and a commercially available bus **212** connecting the storage **204** to the other components of the callee phone **104**. The other components can include at least one commercially available central processing unit (CPU) **214**, one or more commercially available random access memory (RAM) modules **216**, one or more commercially available network interface (NI) component(s) **218**, and one or more commercially available user interface (UI) adapters **220** connected to at least one display device, at least one speaker device, and at least one user-input device of the callee phone **104**. The NI component **218** is configured to connect the callee phone **104** to the network **106**, e.g., commercially available voice and/or data communications protocols. The display device can be a commercially available liquid crystal display (LCD), the speaker device can be a handset or Bluetooth speaker, and the user-input device can be a keyboard, buttons or voice-input device (a microphone). The display and user-input devices can be a touch-screen display configured to display information to the callee and to receive manual input from the callee.

In the respective system configurations **100**A, **100**B, **100**C described hereinbefore, the RAS (RAS) **108** is implemented as a separate standalone system in a separate-RAS configuration **300**A, as shown in FIG. **3**A, or as part of the voicemail server **116** in a RAS-in-voicemail configuration **300**B, as shown in FIG. **3**B, or as part of the callee phone **104** in a RAS-in-phone configuration **300**C, as shown in FIG. **3**C.

As shown in FIGS. **3**A to **3**C, the RAS **108** includes an announcement module **312**, at least one callee details database **304** containing data representing callee details, and a message content file store or database **306** containing data representing message contents. The announcement module **312** can connect to the at least one callee details database **304** for accessing the callee details. The announcement module **312** can connect to the message content database **306** to generate audio announcements. The message content database **306** may include the message content stored as audio data representing pre-recorded messages. The message content database **306** may also include text data representing text content that the announcement module **312** can use to generated audio/video messages using a text-to-speech function or module in the announcement module **312**, the RAS **108**, the callee phone **104**, the voicemail system **116**, or provided by an external computing service (e.g., in a cloud system).

In the separate-RAS configuration **300**A, the RAS **108** (referred to as a "separate RAS") is configured to receive and accept the redirected call and to play the audio/video message for the caller phone **102**, and the separate voicemail server **116** is configured to receive the voicemail from the caller phone **102** separately. In the separate-RAS configuration **300**A, as shown in FIG. **3**A, both the RAS **108** and the separate voicemail server **116** are connected to at least the

voice network in the network **106**. After the audio/video message is played to the caller, the call is redirected from the RAS **108** to the voicemail server **116** over the voice network of the network **106**. In the separated system **300**A, the RAS **108** includes the announcement module **312**, and commercially available announcement system components (e.g., a Cisco Unified IP IVR, or Voxeo Prophecy). The audio/video message can be a pure audio message, e.g., as provided by the commercially available announcement system components. The voicemail server **116** includes commercially available voicemail hardware.

In the RAS-in-voicemail configuration **300**B, as shown in FIG. **3**B, the voicemail server **116** and the RAS **108** (referred to as a "in-voicemail RAS") are combined in the same platform or server. In the RAS-in-voicemail configuration **300**B, the voicemail server **116** is configured to receive and accept the call redirected from the callee phone **104**, play an audio/video message for the caller using the RAS **108**, and receive a voicemail from the caller. In the RAS-in-voicemail configuration **300**B, the rejection voicemail server **116** includes commercially available hardware for voicemail systems (e.g., a Comverse NGVM, or Metaswitch Metasphere voicemail server).

In the RAS-in-phone configuration **300**C, the RAS **108** (referred to as an "in-phone RAS") is provided in the callee phone **104**. This RAS **108** in the callee phone **104** is configured to receive and accept the call and to play the audio/video message for the caller. The voicemail server **108** is separate and configured to receive the voicemail from the caller. In this configuration **300**C, calls rejected with a reason are connected by the callee phone **104** directly to the reject announcement system **108**, without any audio interaction with the callee user (i.e., there is no use of the microphone nor speaker when delivering the audio/video message to the caller phone **102**). The RAS **108** plays out the reject announcement to the caller. After the audio/video message is played to the caller, the call is redirected from the callee phone **104** to the voicemail server **116** over the network **106**. In this configuration, the RAS **108** and the call rejection module **202** may be implemented as a single application (app) for installation on the callee phone **104**.

The call rejection module **202** includes processor-executable data representing executable instructions that are processed by the CPU **214** to generate at least a portion of an incoming call user interface (UI) **400** on the display of the callee phone **104**. The UI **400**, as shown in FIGS. **4**A to **4**C, includes a call incoming indicator **402** indicating that a call from the caller phone **102** is incoming. The call incoming indicator **402** can include a visible indicator, e.g., words and/or symbols appearing on the screen of the callee phone **104**, and/or audible and/or tactile indicators, e.g., a ringing noise and/or a vibrating motion. The UI **400** includes the controls, generated using the rejection options data, for a plurality of response options, which include rejection options, for selection by the callee. The response controls can include at least one accept control **404**, which, when selected by the callee, connects the incoming voice call. The response controls can include at least one reject control, e.g., a straight reject control **406** and a reject-with-reason control **408**. In configurations **300**A and **300**B, when the reject-with-reason control **408** is selected by the callee, it causes the call rejection module **202** to reject the voice call from the callee phone **104** (and the network **106** to redirect the call to the RAS **108**), and send the callee rejection reason data from the callee phone **104** to the announcement module **312**. In configuration **300**C, when the reject-with-reason control **408** is selected by the callee, the call is accepted by the callee phone **104** and redirected to the in-phone RAS **108**.

The generated portion of the UI **400** may be just the additional rejection control, and the remainder of the UI **400** (e.g., including the accept control **404** and the straight reject control **406**) may be generated by one of the standard modules **206** (e.g., a native call-receiving UI of the phone). Thus the generated portion may be referred to as an enhancement rather than a complete user interface. In this way, standard accept and reject controls controlled by a standard call receiving module could be enhanced with the reject-with-reason control **408** controlled by the call rejection module **202**.

The UI **400** can include indicators associated with the respective response option controls, e.g., virtual buttons appearing on a touch-screen interface that can be manually selected by the callee. The controls for receiving the selection from the callee can include input mechanisms available in the callee phone **104**, e.g., input through a touch-screen, keyboard, verbal input through speech-recognition system, accelerometer input caused by manual movement of the phone, etc. The accept control **404** and reject controls **406**, **408** can include soft buttons (on a touch screen) or hard buttons (on a keypad or elsewhere on the callee phone **104**). The reject-with-reason control **408** could be layered visually over another control, e.g., a reject button could be held down to select one or more reject-with-reason controls **408**.

The indicators of the response options, and the options' respective controls, can be generated based on the user preferences data and the rejection options data of the call rejection module **202**. For example, a user may configure the call rejection module **202** to provide a plurality of reject options, and respective reject-with-reason controls **408**, using the user preference data: one of the reject options can cause the call rejection module **202** to generate rejection reason data based on diary data or calendar data in the databases **208** or accessed in a cloud server.

The callee availability data may be stored on the callee phone, and/or may be stored in the cloud and accessed as needed or synchronised from the cloud. The phone may be synchronised with the cloud, or the phone may have visibility of the cloud calendar. In either case, the phone provides the callee availability data, and the call rejection module accesses this data in the phone.

The rejection options data represent which rejection options are provided to the callee when the incoming call is detected, the content of each rejection option, and what rejection message is associated with each rejection option. The rejection options data can represent the labels of the reject-with-reason controls shown or announced by the UI **400**, e.g., the text of the options **408** shown in FIGS. **4**B and **4**C. The rejection options data also represent the rejection messages corresponding to the labels. For example, as shown in FIG. **4**B, example labels of the provided rejection options can be (i) "HI, PLEASE TRY CALLING SUSAN ON (08) 8465 1666"; (ii) "BEST TIME TO CALL IS 12 PM"; and (iii) "CURRENTLY AT LUNCH". These example labels can have the following corresponding example rejection messages defined in the rejection options data: (i) "I'm busy, please contact Susan on 8465 1666"; (ii) "Hi, the best time to call me is 12 p.m."; and (iii) "Hi, I am currently at lunch". The example rejection messages (or at least a code representing the rejection message that the RAS **108** is configured to decode to generate the rejection message, e.g., using a code dictionary defining available message content portions) are stored in the rejection options data, and when one of the controls is selected, the corresponding example rejection

message is sent in the rejection reason data to the announcement system **108**. Other example labels stored in the rejection options data can include "HI, I'LL BE BACK IN THE OFFICE ON MONDAY.", "IN A MEETING, FREE AT 3 PM", "IN BACK-TO-BACK MEETINGS, FREE AFTER 4 PM", and "I'LL CALL YOU BACK SOON", etc. Other example rejection messages stored in the rejection options data (in association with respective example labels) can include "[NAME] is on a call", "[NAME] is on leave", or "[NAME] is overseas", etc., where "[NAME]" refers to the name of the callee extracted from the user preferences data.

A user can configure their communications device to be an embodiment of the callee phone **104** by installing software that provides the call rejection module **202**, e.g., by downloading and installing a software application on a smart phone or mobile handset. As mentioned previously, the call rejection module **202** can be a VoIP client, and can be written using a commercially available programming language (e.g., JAVA or Objective C) and compiled for a commercially available operating system (e.g., iOS, Android).

The announcement module **312** includes processor-executable data representing executable instructions stored in the RAS **108**. These instructions are processed by one or more CPUs. The RAS **108** can include commercially available text-to-speech systems and systems to map portions of the received rejection message to pre-recorded audio content/sounds/announcements (e.g., if the person is free in 27 minutes, this could be mapped to 30 mins, and the system could play out a pre-recorded announcement (e.g., in the callee's voice) referring to the 30 mins).

In operation, as shown in FIGS. **5**A, **5**B and **5**C, the systems **100**A, **100**B and **100**C perform communications methods **500**A, **500**B and **500**C respectively (based on the configuration) including the following steps:

the call rejection module **202** receives an incoming voice call request or alert from the caller phone **102** over the voice network **106**, e.g., based on a quasi-unique identifier of the call rejection module **202**, such as a telephone number, and based on standard ITU/IETF protocols, including the incoming call signalling delivered using the call signalling path in the network **106** (step **502**);

the call rejection module **202** generates the rejection options data based on the user preferences data in the phone and/or available data from the standard modules **206** in the phone (step **503**);

the call rejection module **202** generates data for the rejection options in at least a portion of an incoming call UI—e.g., the call incoming indicator **402** in the UI **400** is generated based on the incoming voice call—and the call rejection module **202** provides response options for selection by the callee, and receives data from the UI **400** indicating activation of one of the response controls (step **504**); in embodiments, the response controls can be actuated using a plurality of user inputs: a first input can initiate a display of the options and change the alert tone (the ringing); and a second input can select one of the displayed options.

in methods **500**A and **500**B, the call rejection module **202** rejects the voice call from the callee phone **104** to the network **106** in response to selection of one of the reject options, either by sending the voice rejection signal using the call signalling path to the network **106** based on the standard protocols or by waiting for the pre-selected answer time to expire, and allowing the network **106** to redirect the call to the reject announcement system **108** (step **506**);

in method **500**C, the call rejection module **202** redirects the voice call from the callee phone **104** in response to selection of one of the rejection options to the RAS **108** within the callee phone **104** which accepts the call (step **507**);

the call rejection module **202** generates the rejection reason data, representing information (e.g., an unavailability reason, an availability time, an alternate contact, a location, etc.) that may assist the caller, based on available data from the phone and/or the rejection options data, and based on the user's selection of a reject-with-reason option (step **508**);

the call rejection module **202** sends the rejection reason data to the reject announcement system **108** either over the connection **114** for methods **500**A, **500**B (which can be in the rejection reason path that is separate from the call signalling path), or within the phone for method **500**C, which can include passing data from module to module, or function to function, in an application (app), or saving and accessing the data in shared memory (step **510**);

in methods **500**A and **500**B, the RAS **108** receives the redirected call (step **512**);

the RAS **108** receives the rejection reason data (step **513**);

in methods **500**A and **500**B, the announcement module **312** matches the received rejection reason data to the callee, e.g., based on their phone number (step **514**A);

the announcement module **312** generates an audio/video message for the caller based on the rejection reason data, any codes required to decode the rejection message (e.g., in a code dictionary), and optionally based on callee data stored in the callee details database **304** and/or recorded content/sounds/announcements (also referred to as message portions, or stored messages) in the message content database **306**, plays the audio/video message for the caller, and based on this rejection reason data generates a confirmation message for the callee phone indicating that the call was rejected and optionally the content of the audio/video message (step **514**B);

optionally in methods in **500**A and **500**C, the call is then redirected to the voicemail server **116** (step **515**); and

optionally the voicemail server **116** records the voicemail message (which is also referred to as a voicemail) from the caller (step **516**).

In the systems **100**A and **100**B, the calls are redirected from the callee phone **104** and accepted by the announcement system **108** using standard methods in the network **106**, e.g., to play out a generic audio/video message. In the separated system **300**A, the call is also redirected by the network **106** from the RAS **108** to the voicemail server **116**. In the system **300**C, the call is redirected from the callee phone **104** to the voicemail server **116** using standard methods in the network **106**.

Step **508** may occur before steps **502**, **504** and/or **506**: thus the rejection reason data can be at least partially pre-generated (e.g., based on the rejection options data, and/or current availability data) before the call is received, thus allowing the rejection reason data to be sent in step **510** quickly once the call is rejected in step **506**.

In method **500**A and **500**B, the rejection reason data can be sent in step **510** to the RAS **108** using the in-band signalling (e.g., session initiation protocol (SIP) signalling if the callee is using VoIP), or the out-of-band signalling (e.g., a separate data communication path from the voice call, which may use a data network separate from the voice network of network **106**). The rejection reason data are sent sufficiently quickly (e.g., in less than one second) to the announcement module **312** to allow the audio/video message to be played within a reasonable time of the announcement system **108** receiving the call. In embodiments using the rejection reason path that is separate and independent from the call signalling path, the rejection reason data may include identifying (ID) data, e.g.,

a callee telephone number and/or a time stamp of the call rejection, which is used by the RAS **108** to correlate (i.e., match) the rejection reason data with the incoming rejected call and/or select the audio/video message for the caller.

In method **500**C, the rejection reason data are kept internal to the callee phone **104** in steps **510** and **513**.

The call-transfer steps **506**, **512** and **507** for rejecting, redirecting and/or receiving the call by the RAS **108** can occur before, after, or contemporaneously with the data-transfer steps **508**, **510** and **513** for generating, sending and the receiving the rejection reason data by the RAS **108**. The call-transfer and data-transfer steps may overlap with each other, so long as they commence after the callee selects a reject reason and complete before the audio/video message is played to the caller.

The announcement system **108** can include commercially available text-to-speech systems to play out the audio/video message and/or one or more pre-recorded sounds forming portions/parts of the audio/video message, e.g., a pre-recorded comments from the specific callee. An example message could include a callee identifier (ID) or name, and an availability time, e.g., "Hi, this is Peter. According to my calendar, I am busy until 3 pm. Please leave a voicemail message." For pre-recorded comments relating to numerical intervals, the announcement module **312**, and/or the call rejection module **202**, can process the available data representing numbers (e.g., times or durations) based on logical rules to: (a) approximate specific numbers (e.g., the end time of a meeting, or the duration of an out-of-office message) to correspond to available stored comments in the message content database **306**; and (b) aggregate appropriate values (e.g., adjacent busy times in a calendar can be concatenated or summed). For instance, the playout may be pre-set to intervals of the callee being busy for the next "5 minutes", "15 minutes", "30 minutes", "1 hour", "2 hours", or indicate that the callee is busy until "9 am", "10 am", "11 am", etc. These intervals can be spoken by the callee in a recording session prior to the call (or generic recordings could be used), and the sounds can be stored as audio files in the message content database **306**. The available recorded intervals may be defined in the user preferences data and used to generate the rejection option data for the labels and the message.

The call rejection module **202** can have a user preference in the user preferences data indicating a default response option. For example, a default reject option can be to select a particular audio/video message, e.g., an out-of-office message. The call rejection module **202** may provide the call incoming indicator **402** if the callee phone **104** is already engaged in a call, and a second incoming call is received, specifically if a "call waiting setting" is selected in the user preferences data.

The callee phone **104** can determine a caller identifier (ID) of the incoming caller's phone (e.g., a telephone number), and use this identifier to select data for the rejection reason data, e.g., by checking if they belong to a pre-defined group (e.g., in a contacts database). If the caller ID is in the pre-defined group, the rejection module **202** can select a different reject control **406**, **408**, (e.g., an "out of office" message specific for the group) i.e., different options can be presented on the UI **400**.

The confirmation message generated for the callee phone **104** can be a short label associated with the audio/video message. The confirmation message is generated by the call rejection module based on confirmation data generated based on the selected reject control. This confirmation data can be the same or equivalent data as the rejection reason data, or separate data generated in response to the control selection. The confirmation message provides confirmation to the callee user that the call rejection module has rejected or redirected the call, and/or that the RAS is playing the audio/video message to the caller. The confirmation message may also represent the available data to indicate the contents of the audio/video message that has been played out to the caller, e.g., exactly how long the caller has been told to wait, or what the caller has been instructed to do. The confirmation message may thus represent the selected reject reason and/or the audio/video message, e.g., the confirmation message may include a short label of text such as "rejecting call with announcement", or "rejecting call: busy for 45 mins". The confirmation message may include visual, audible and/or tactile elements, such as the short label describing the rejection message, or a distinctive vibration sequence. The confirmation message may be stored in confirmation log data in the callee phone **104** so the callee can later review what various callers have been told by the rejection announcement server **108**, e.g., before calling the callers back.

Each of the blocks of the flow diagrams of the methods **500**A, **500**B, **500**C (which can be may be provided by a module (including modules **206**, **202**, **108**) or a portion of a module. The processes and modules are provided by computer-executable instructions stored in computer-readable storage, and these computer-executable instructions are configured to control one or more computer processors (e.g., in-phone computer processors, at least for the RAS-in-phone configuration **300**C) to execute the steps of at least the communications processes **500**A, **500**B, **500**C. Thus the processes and modules are embodied in a machine-readable and/or computer-readable medium, which is non-transitory, for configuring a computer system to execute the method. The modules may be stored within and/or transmitted to a computer system memory to configure the computer system to perform the functions of the module. The boundaries between the modules and components in the in-phone modules **206**, **202**, **108** are exemplary, and alternative embodiments may merge modules or impose an alternative decomposition of functionality of modules. For example, the modules discussed herein may be decomposed into submodules to be executed as multiple computer processes, and, optionally, on multiple computers. Moreover, alternative embodiments may combine multiple instances of a particular module or submodule. Furthermore, the operations may be combined or the functionality of the operations may be distributed in additional operations. Alternatively, such actions may be embodied in the structure of circuitry that implements such functionality, such as the micro-code of a complex instruction set computer (CISC) or a reduced instruction set computer (RISC), firmware programmed into programmable or erasable/programmable devices, the configuration of a field-programmable gate array (FPGA), the design of a gate array or full-custom application-specific integrated circuit (ASIC), or the like.

Example Embodiments

An example callee phone based on VoIP could operate according to the following.

The example in-phone rejection module performs a background task to maintain the rejection options data. The background task maintains the rejection options data representing the current rejection options by monitoring the available data on the example callee phone (e.g., out-of-office settings, calendar schedules, etc.). The rejection options data can be referred to as including "dynamic data", i.e., data that changes based on the current system time (e.g., a next-free time). The current rejection options can define the next avail-

able free time based on available calendar entries in the example callee phone. The background task can also partially prepare the rejection options data, and the rejection reason data, e.g., based on the rejection options data and the available data.

For an incoming call, the example callee phone displays additional buttons for reject-with-specific-reason options, or provides a control to reveal the additional call reject-with-reason options (e.g., as a drop-down selection), or plays the options audibly. The controls are labelled with example labels from the rejection options data. The example labels may include dynamic data, e.g., based on the current rejection options data, such as "busy—free at 3 pm", where the "3 pm" is generated based on the system time and an aggregate of the calendar durations/times by the background task. The buttons display the example labels, which can be pre-defined by the user. The example labels (e.g., "Busy—Free at 3 pm") are a representation of the reject reason that are brief/short to fit in the example UI (e.g., being limited to a selected number of text characters, or a selected display size, or a selected duration for an audio label). The rejection reason data also represent example rejection messages (e.g., "I'm busy at the moment, but will be free at 3 pm") for sending in the rejection reason data that are more extensive than the associated labels.

If the user selects one of the call-reject-with-reason options, then the example callee phone generates the rejection reason data representing the actual message to be sent, and inserts the rejection reason data into the SIP signalling.

The example network redirects the call to an example announcement module, which:

receives the incoming call;

checks the original called number (i.e., the callee ID);

checks the rejection message in the rejection reason data; and

checks the callee ID's settings in preferences data in the example RAS.

If the received reject reason matches a preset reason that is associated with a preset voice recording, the example announcement module plays that preset recorded message; else if the reject reason has a dynamic component (e.g., time), and the settings show prerecorded times, then the example announcement system maps the given time to the closest pre-recorded time, and plays that announcement; else the example announcement system uses a standard text-to-speech system to read out the message.

After the message playout is complete, the example announcement system forwards the call to an example voicemail system.

An alternative example system could be implemented where the RAS **108** is implemented in a callee mobile smartphone as part of an Android VoIP app (Android version 4.0 and above), according to the following.

The example callee mobile smartphone app accesses calendar data on the callee's mobile smartphone using standard Android Calendar Provider APIs, whether such calendar information is stored locally, or accessed from the cloud (e.g., using Exchange ActiveSync, and/or Google Calendar).

Incoming calls cause the example app to display standard and normal accept and reject call options, together with a Reject Assistant pull up tray or control. If the user selects this tray, the example app causes reject options to appear for the user to select, and the ringing changes (e.g., to vibrate).

The reject options provided include two or more predefined messages including "I'll phone you back", and "Can you send a message?"

In addition, the example app causes reject options to be displayed based on the user's calendar entries. If the user does not have a current calendar entry, then "I'm busy for the next 20 minutes" is generated and displayed as an option. If the user does have a calendar entry covering the current time, then an option is generated and displayed showing the time to the end of the current calendar/meeting entry, e.g., "I'm busy for the next 45 minutes". If the user has back-to-back calendar entries, then another option is provided with a timeframe corresponding to the end of the back-to-back meetings, e.g., "I'm busy for the next 135 minutes". The generated option can thus be generated using an aggregate (e.g., a summation or a concatenation) of the durations/times of the plurality of calendar entries.

If the user selects a reject reason for an incoming call, the example app causes the call to be accepted onto the phone, and causes an example audio/video message to be played out to the caller. This call does not use the callee phone's microphone or speaker. Furthermore, the example app causes an example visual confirmation message to be generated and displayed on the example callee phone based on the selected option. The example confirmation message indicates that one of the rejection-with-reason options has been selected, e.g., "rejecting with announcement".

The audio of the played-out message can be pre-generated using a text-to-speech system (e.g., using the commercially available Acapela text-to-speech engine offline), and can be stored with or in the example app (e.g., pre-generated audio files can be stored in a file store on the callee phone **108**). In the case of calendar-based reject messages, the audio that is played out is a combination of audio files, consisting of pre-defined messages, together with separate portions generated using a text-to-speech conversion of the time. The time used for the audio/video message and the visual message is rounded to discrete values (e.g., 5 mins, 10 mins) by the example app. The separate audio segments or portions that play out the static parts of the audio/video messages and the various available/possible time values can be pre-generated using the text-to-speech system and stored in the phone **108**. At the time of the making the announcement (i.e., playing out the audio/video message), example the RAS accesses the selected files for the message, concatenates them based on the rejection reason data (e.g., selecting a static portion based on the rejection option, and a time portion based on calendar data), and plays out the concatenated audio/video message: for example, a static portion "the person you have called is not available for the next" can be concatenated with a selected time portion "45 minutes" and a further static portion "but is able to contact you thereafter" to create an example audio/video message. The audio/video message can be generated based on the rejection reason data, which can represent the selected reject option. The audio/video message can be generated using an aggregate (e.g., a summation or a concatenation) of the durations of the plurality of calendar entries.

The played-out messages are longer than the short label provided in the callee user interface. For instance, the played out message for the calendar entry may be "The person you have called is not available for the next 45 minutes, but is able to read voicemails. Please stay on the line to be directed to voicemail".

At the end of the playout of the reject announcement message, the call is redirected to the voicemail server, allowing the caller to leave a voicemail as per normal.

Interpretation

Many modifications will be apparent to those skilled in the art without departing from the scope of the present invention.

The reference in this specification to any prior publication (or information derived from it), or to any matter which is known, is not, and should not be taken as an acknowledgment

or admission or any form of suggestion that the prior publication (or information derived from it) or known matter forms part of the common general knowledge in the field of endeavour to which this specification relates.

The claims defining the invention are as follows:

1. A system including:

a rejection module in a phone configured to receive calls over a network; and

a remote rejection announcement server (RAS) configured to receive calls over the network,

wherein the rejection module is configured to:

generate at least a portion of an incoming call user interface (UI) on the phone, said UI indicating incoming call signalling, associated with an incoming call from a caller, over a call signalling path in the network;

provide one or more rejection options for selection by a user of the phone;

generate rejection reason data based on selection of one of the rejection options; and

send the rejection reason data using a rejection reason path that is separate from the call signalling path, and

wherein the remote RAS is configured to:

receive the incoming call from the caller;

receive the rejection reason data over the rejection reason path; and

generate, based on the rejection reason data, an audio/video message for the caller,

wherein the rejection options and/or the rejection reason data are generated based on user availability data, representing when the user is available, which is generated using calendar data from the phone, and

wherein the rejection reason data represent a plurality of calendar entries, and the audio/video message represents times or durations of the plurality of calendar entries.

2. The system of claim **1**, wherein the audio/video message represents an aggregate of the durations of the plurality of calendar entries.

3. The system of claim **1**, wherein the rejection options and/or the rejection reason data are generated based on available data on the phone including any one or more of:

predefined message data representing predefined rejection messages;

personal contact data available on the phone;

location data available on the phone representing a current location of the phone;

status data available on the phone representing a current status of the user; and

presence data available on the phone representing a presence of the user.

4. The system of claim **3**, wherein the available data are stored on the phone or are available on the phone from a remote server.

5. The system of claim **1**,

wherein the rejection module is configured to detect the incoming call over the network,

wherein the incoming call includes a request for an audio call or a video call, and

wherein the rejected call is redirected to the RAS by the network.

6. The system of claim **1**, including a voicemail server configured to receive the call from the RAS after the audio/video message is played for the caller.

7. The system of claim **1**, wherein the RAS is in a voicemail server in communication with the network.

8. The system of claim **1**, wherein the rejection module is configured to generate a confirmation message for display by the phone representing the selected one of the rejection options and/or the rejection reason data.

9. A communications method including the steps of:

indicating incoming call signalling, associated with an incoming call from a caller, over a call signalling path in a network by generating at least a portion of an incoming call user interface (UI) on a phone;

providing one or more rejection options for selection by a user of the phone;

generating rejection reason data based on selection of one of the rejection options;

sending the rejection reason data using a rejection reason path that is separate from the call signalling path;

receiving the incoming call from the caller at a remote rejection announcement system (RAS);

receiving the rejection reason data at the remote RAS over the rejection reason path;

generating, based on the rejection reason data, an audio/video message for the caller; and

generating the rejection options and/or the rejection reason data based on user availability data, representing when the user is available, which is generated using calendar data from the phone,

wherein the rejection reason data represent a plurality of calendar entries, and the audio/video message represents times or durations of the plurality of calendar entries.

10. The communications method of claim **9**, wherein the audio/video message represents an aggregate of the durations of the plurality of calendar entries.

11. The communications method of claim **9**, including receiving a voicemail message after playing the audio/video message for the caller.

12. The communications method of claim **9**, including the steps of:

receiving a request on the phone to accept the incoming call from the caller; and

accepting the rejected call at the RAS.

13. The communications method of claim **9**, including generating a confirmation message for display by the phone representing the selected one of the rejection options and/or rejection reason data.

14. A non-transitory, machine readable medium having stored thereon instructions for a communications method, the stored instructions comprising machine executable code, which when executed by at least one machine processor, causes the machine processor to:

indicate incoming call signalling, associated with an incoming call from a caller, over a call signalling path in a network by generating at least a portion of an incoming call user interface (UI) on a phone;

provide one or more rejection options for selection by a user of the phone;

generate rejection reason data based on selection of one of the rejection options;

send the rejection reason data using a rejection reason path that is separate from the call signalling path;

receive the incoming call from the caller at a remote rejection announcement system (RAS);

receive the rejection reason data at the remote RAS over the rejection reason path;

generate, based on the rejection reason data, an audio/video message for the caller; and

generate the rejection options and/or the rejection reason data based on user availability data, representing when the user is available, using calendar data from the phone,

wherein the rejection reason data represent a plurality of calendar entries, and the audio/video message represents times or durations of the plurality of calendar entries.

15. A system including:

a rejection module in a phone configured to receive calls over a network; and

a remote rejection announcement server (RAS) configured to receive calls over the network,

wherein the rejection module is configured to:

generate at least a portion of an incoming call user interface (UI) on the phone, said UI indicating incoming call signalling, associated with an incoming call from a caller, over a call signalling path in the network;

provide one or more rejection options for selection by a user of the phone;

generate rejection reason data based on selection of one of the rejection options; and

send the rejection reason data using a rejection reason path that is separate from the call signalling path, and

wherein the remote RAS is configured to:

receive the incoming call from the caller;

receive the rejection reason data over the rejection reason path; and

generate, based on the rejection reason data, an audio/video message for the caller,

wherein the rejection reason path is an Internet Protocol (IP) path, and the incoming call signalling is based on a circuit-switched protocol or a packet-switched protocol, and wherein the rejection module is configured to send a voice rejection signal to the network over a voice-rejection path based on the circuit-switched protocol or the packet-switched protocol indicating the rejection of the incoming call from the phone.

16. The system of claim **15**, wherein the rejection options and/or the rejection reason data are generated based on user availability data, representing when the user is available, which is generated using calendar data from the phone.

17. The system of claim **16**, wherein the rejection reason data represent a plurality of calendar entries, and the audio/video message represents times or durations of the plurality of calendar entries.

18. The system of claim **17**, wherein the audio/video message represents an aggregate of the durations of the plurality of calendar entries.

19. The system of claim **15**, wherein the rejection options and/or the rejection reason data are generated based on available data on the phone including any one or more of:

predefined message data representing predefined rejection messages;

personal contact data available on the phone;

location data available on the phone representing a current location of the phone;

status data available on the phone representing a current status of the user; and

presence data available on the phone representing a presence of the user.

20. The system of claim **19**, wherein the available data are stored on the phone or are available on the phone from a remote server.

21. The system of claim **15**,

wherein the rejection module is configured to detect the incoming call over the network,

wherein the incoming call includes a request for an audio call or a video call, and

wherein the rejected call is redirected to the RAS by the network.

22. The system of claim **15**, including a voicemail server configured to receive the call from the RAS after the audio/video message is played for the caller.

23. The system of claim **15**, wherein the RAS is in a voicemail server in communication with the network.

24. The system of claim **15**, wherein the rejection module is configured to generate a confirmation message for display by the phone representing the selected one of the rejection options and/or the rejection reason data.

25. A communications method including the steps of:

indicating incoming call signalling, associated with an incoming call from a caller, over a call signalling path in a network by generating at least a portion of an incoming call user interface (UI) on a phone;

providing one or more rejection options for selection by a user of the phone;

generating rejection reason data based on selection of one of the rejection options;

sending the rejection reason data using a rejection reason path that is separate from the call signalling path;

receiving the incoming call from the caller at a remote rejection announcement system (RAS);

receiving the rejection reason data at the remote RAS over the rejection reason path; and

generating, based on the rejection reason data, an audio/video message for the caller, wherein the rejection reason path is an Internet Protocol (IP) path, and the incoming call signalling is based on a circuit-switched protocol or a packet-switched protocol, and including sending a voice rejection signal to the network over a voice-rejection path based on the circuit-switched protocol or the packet-switched protocol indicating the rejection of the incoming call from the phone.

26. The communications method of claim **25**, including generating the rejection options and/or the rejection reason data based on user availability data, representing when the user is available, which is generated using calendar data from the phone.

27. The communications method of claim **26**, wherein the rejection reason data represent a plurality of calendar entries, and the audio/video message represents times or durations of the plurality of calendar entries.

28. The communications method of claim **27**, wherein the audio/video message represents an aggregate of the durations of the plurality of calendar entries.

29. The communications method of claim **25**, including receiving a voicemail message after playing the audio/video message for the caller.

30. The communications method of claim **25**, including the steps of:

receiving a request on the phone to accept the incoming call from the caller; and

accepting the rejected call at the RAS.

31. The communications method of claim **25**, including generating a confirmation message for display by the phone representing the selected one of the rejection options and/or rejection reason data.

32. A non-transitory, machine readable medium having stored thereon instructions for a communications method, the stored instructions comprising machine executable code, which when executed by at least one machine processor, causes the machine processor to:

indicate incoming call signalling, associated with an incoming call from a caller, over a call signalling path in a network by generating at least a portion of an incoming call user interface (UI) on a phone;

provide one or more rejection options for selection by a user of the phone;

generate rejection reason data based on selection of one of the rejection options;

send the rejection reason data using a rejection reason path that is separate from the call signalling path, wherein the rejection reason path is an Internet Protocol (IP) path, and the incoming call signalling is based on a circuit-switched protocol or a packet-switched protocol;

send a voice rejection signal to the network over a voice-rejection path based on the circuit-switched protocol or the packet-switched protocol indicating the rejection of the incoming call from the phone;

receive the incoming call from the caller at a remote rejection announcement system (RAS);

receive the rejection reason data at the remote RAS over the rejection reason path; and

generate, based on the rejection reason data, an audio/video message for the caller.

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